Fiscal Consolidation, Fiscal Policy Transmission, and Current Account Dynamics in South Africa

Christine S. Makanza*and J. Paul Dunne†

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Abstract

The debate on global current account imbalances continues to develop, with growing interest in the macroeconomic instability and widening current account deficits faced by emerging markets. Literature establishes that the current account behaves differently depending on macroeconomic circumstances in countries, so approaches to managing external imbalances should be country tailored. Despite this realisation, there is a lack of investigation into drivers of the current account and the impact of macroeconomic policy on current account dynamics in emerging markets. To address this, the study estimates an SVAR model to analyse the effect of fiscal shocks on the current account. This helps to understand how fiscal shocks shape current account developments, and establishes the usefulness of fiscal consolidation in managing current account deficits by determining whether the twin deficits approach to managing the external balance holds in middle income countries. The study goes further to analyse the channels through which fiscal shocks are transmitted to the current account to understand how current account management policies should be formulated. The study contributes to the literature by providing a case study of South Africa, an emerging economy characterised by large current account deficits, macroeconomic volatility, a well developed financial sector, and a dataset which has not been exploited to understand the external balance. A particularly interesting finding is that expansionary fiscal shocks improve the current account through household savings and public investment , which is a departure from the twin deficits hypothesis.

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*Corresponding author: University of Cape Town-School of Economics, christinemakanza@gmail.com

†University of Cape Town-School of Economics, John.Dunne@uct.ac.za

1 Introduction

There has been considerable debate over the importance of current account balances, with recent arguments that imbalances, while possibly justifiable by fundamentals, can also signal elevated macroeconomic and financial stresses and problems (Obstfeld 2012). Despite these growing concerns, relatively little attention has been paid to studying what determines current account deficits and their dynamics in emerging market economies, particularly given that emerging markets may be prone to economic and financial sector instability due to the volatility of capital flows that finance current account deficits (Claessens & Ghosh 2013). Understanding the determinants of current account deficits more generally can be valuable by providing insights into whether these deficits could be used as an early warning signal for potential macroeconomic instability that might warrant intervention. For example, while a short-run current account deficit may reflect heightened levels of consumption and investment, in the long-run it may not be sustainable, particularly if financed through borrowing.

Most of the existing empirical literature on current account dynamics has been based on cross country datasets, with the few case studies that exist being mainly for developed countries, despite the fact that the cross country studies tended to find that the factors that affect the current account differ between developed and developing countries (e.g. Calderón, Chong & Zanforlin 2007, Chinn & Prasad 2003). Recent studies find that depending on the nature of output shocks, components of the government budget balance, the structure of a particular economy and a country's income level, the relationship between the current account and fiscal deficit may in fact be negatively correlated in an open economy (see Rafiq 2010), as opposed to the theoretical expectations of the twin deficits hypothesis. This is because an open economy enables consumers to smooth consumption by lending and borrowing in international capital markets, and in so doing, attracts short term capital inflows to finance deficits. This suggests that it is important to try to understand the evolution of current account deficits and their determinants in countries of different income levels and openness, and this requires case study analysis to augment the cross country studies.

This paper contributes to the literature by providing South Africa as a case study of an emerging economy. South Africa has developing country characteristics, relatively well developed industrial and financial sectors, a relatively high current account deficit in comparison to similar emerging markets, and impressive data availability, (IMF 2013). In the study, we investigate the interaction of fiscal policy with the external balance by determining the effect of fiscal aggregates on current account movements, and the channels through which fiscal shocks are transmitted to the current account. This allows the identification of policy options to influence the impact of fiscal policy on the evolution of the current account.

The next section discusses the approaches to defining the current account whilst analysing how fiscal deficits interact with current account deficits, and then reviews developments in the current account and fiscal policy literature. Section 3 then describes the experience of South Africa in terms of the evolution of fiscal policy and the current account. This is followed by an exposition of the chosen theoretical model in section 4. The estimation, model identification and data issues are then presented in section 5, with section 6 giving the estimation results. Finally, section 7 presents some conclusions.

2 Fiscal Determinants of the Current Account

It is possible to define the current account as the sum of the trade balance, income and transfers. This definition is the absorption approach which describes the balance of payments as the outcome of export and import activities, as well as the level of absorption and investment in an economy (Alexander (1952) and Johnson et al. (1958) give a detailed discussion of this approach). This approach however does not account for the role of intertemporal decisions made by economic agents in their saving and investment behaviour, nor does it consider how these decisions affect the current account balance. This makes it difficult to analyse how current decisions impact future current account imbalances. Alternatively, the change in net foreign assets which describes how the current account is determined by the level of foreign capital in an economy, or the difference between national savings and domestic investment can also be used to define the current account. As this study is concerned with how fiscal shocks are transmitted to private and public investment as well as public and private savings, the savings-investment gap is used to define the current account.

There are two dominant theoretical perspectives that arise from the interaction of the current account with the savings-investment relationship, both of which can be illustrated by manipulating the national income identity. These perspectives equate the current account (CA) to the savings-investment gap ($S - I$) when assuming a balanced budget, or to the government budget balance ($T - G$) when assuming savings and investment are equal (see equation 1)[1].

$$S - I = (G - T) + CA \quad \Longrightarrow \quad CA = (S - I) + (T - G) \tag{1}$$

[1] *Proof*: $Y = C + I + G + NX$; *but* $Y - C - T = S$
$\Rightarrow S = G - T + NX + I$
$\Rightarrow CA(NX) = (S - I) + (T - G)$.
$\Rightarrow CA = S - I$ if $(T - G) = 0$ or $CA = T - G$ if $(S - I) = 0$
Y where is output, C is consumption, I is investment, G is government expenditure, NX are net exports, T are taxes, S are savings and CA is the current account balance.

Focusing on the savings-investment gap is the basis of the Intertemporal Approach to the Current Account by Obstfeld & Rogoff (1995). The Intertemporal Approach is built on the premise that expectations about productivity growth, government spending, current and future prices affect savings and investment decisions of residents of a nation, and has become the dominant theoretical approach within the literature (e.g. Obstfeld & Rogoff 1996, Bergin 2006, Lu 2012). This approach postulates a positive relationship between the current account deficit and government budget deficit, suggesting that an increase in government expenditure will lead to a deterioration of the current account balance towards a deficit. This is the basis of the twin deficits hypothesis (Feldstein 1983).

Most cross country empirical studies based on the twin deficits hypothesis have found a strong link between budget deficits or public spending and the trade balance, implying that strengthening of the fiscal balance improves the current account position (twin deficits), with the association as strong in emerging economies as in advanced ones (e.g. Abbas, Bouhga-Hagbe, Fatás, Mauro & Velloso 2011, Lau, Mansor & Puah 2010, Beetsma, Giuliodori & Klaassen 2008, Calderon, Chong & Loayza 2002, Salvatore 2006). For example, in analysing the external balance of the G7 countries, Salvatore (2006) finds strong evidence of a negative relationship between the fiscal budget and the current account deficit in the descriptive analysis. However, this negative correlation is disputed in regression analysis, with results concluding that the twin deficits hold for the G7 countries, and the impact of fiscal policy on the current account is lagged by at least a year, with the length of the lagged response varying across countries. In a group of Asian emerging markets, Lau et al. (2010) find evidence of a long run relationship between the current account deficit and budget deficit implying that fiscal discipline leads to current account improvement, but the strength of this relationship varies across countries. Cross country studies use panel data methods but often suffer from a joint endogeneity problem (e.g. Calderon et al. 2002, Calderón et al. 2007). The studies also show evidence of heterogeneity as the interaction between fiscal policy and the current account differs across the countries in the panel. This implies the generalised results may not necessarily be applied to the context of individual countries, and supports the need for case studies to understand country level dynamics.

Some recent empirical works find evidence of expansionary fiscal policy resulting in an improvement of the current account balance (twin divergence), particularly in higher income countries with more liberal financial systems, (e.g. Kim & Roubini 2008, Muller 2008, Rafiq 2010). These studies are based on the open economy macroeconomics literature which controls for business cycle fluctuations and predicts that because of the endogenous response of the current account and budget balance to business cycles, comovements between the current account and fiscal balance are driven more by output shocks as opposed to fiscal shocks alone. For example, when fiscal expenditure is procyclical, a boom in output will

lead to an increase in government spending, but however, the current account endogenously responds to the increased productivity which expands the export base, and the current account position improves, causing a negative correlation between the current account balance and fiscal balance. As a result, a scenario where an expansion of the fiscal deficit improves the current account position is likely to emerge when there are cyclical productivity shocks, and endogeneity of the budget deficit is taken into account (see Kim & Roubini 2008). Such a result implies that fiscal consolidation, through an expansion of the tax base or reduction in government expenditure may fail to induce an improvement of the current account position. This notion goes against earlier results in line with the twin deficits hypothesis, and is evidence to the variation in the current account and fiscal policy relationship, depending on a country's income level and macroeconomic conditions such as the strength of the business cycle.

There are a few studies available that analyse the relationship between the current account / trade balance and fiscal policy in developing countries (e.g. Anoruo & Ramchander 1998, Egwaikhide 1999, Marinheiro 2008). For example, Egwaikhide (1999) finds that a worsening of the fiscal deficit causes a deterioration of the trade balance in Nigeria, whilst Anoruo & Ramchander (1998) (in Egypt) and Marinheiro (2008) (in India, Indonesia, Korea, Malaysia and Philippines) find that causality actually runs from the external balance to government expenditure, with a deterioration of the trade balance causing an increase in fiscal expenditure. An important point to note about these studies however is that they are all prior to the 2008 financial crisis, implying they do not capture the dynamics between the current account and fiscal policy that may be a result of business cycle fluctuations brought about by the financial crisis. In addition, most of the economies in these studies have now evolved to emerging markets, implying they have different macroeconomic conditions from the time these studies were conducted, and this warrants further investigation into the current account balances of EMEs. Further investigation not only to analyses the possible effects of business cycle fluctuations after the financial crisis, but updates the analysis to consider the relationship between the current account and fiscal policy when economies become emerging markets.

Structural Vector Autoregressive Models (SVARs) have become a common feature in analysing current account and fiscal dynamics at a country specific level (e.g. Lee & Chinn 2006, Hoffmann 2003, Kano 2008, Kim & Roubini 2008, Corsetti & Muller 2006) because of their ability to control for endogeneity and incorporate theoretical restrictions in the identification of the model. Some studies use New Open Economy Models (NOEM) (e.g. Tervala 2012, Kumhof & Laxton 2013) to analyse the impact of fiscal expansions on the current account, but whilst these studies provide a framework for modelling household behaviour, when analysing the country level links between current account dynamics and fiscal

aggregates, these models do not out-perform SVARs. Consequently, based on the relatively superior performance of SVARs over panel data models and NOEMs, and the ability of SVAR models to isolate the exogenous component of business cycles and fiscal shocks through the choice of identification restrictions, this study proceeds to use a structural VAR model to analyse fiscal determinants of the current account in emerging markets that exhibit pro-cyclical fiscal policy.

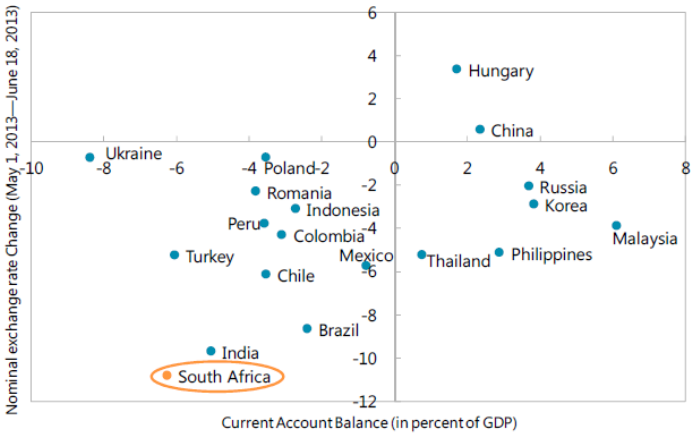
These empirical advancements highlight the importance of identifying output shocks and business cycle fluctuations in shaping the relationship between the external balance and fiscal policy, but surprisingly there is a lack of investigation into this relationship in emerging markets given the contribution of output shocks. Studies that analyse the current account in South Africa have so far only focused on the likelihood of sudden stops and sustainability of the deficits, for example, Frankel, Smit & Sturzenegger (2008) and Kandiero (2007) argue that South Africa's current account position is a result of investment goods and strong consumer related products with a sudden stop of capital flows being unlikely, whilst Searle, Mama et al. (2010) and Smit (2007) conclude that the current account deficit in South Africa is sustainable and is cushioned by the level of capital flows and reserves. This lack of investigation into current account determinants, and South Africa's susceptibility to business cycle fluctuations (see Du Plessis 2006) motivate the use of South Africa as a case study for this analysis. In addition to business cycle fluctuations, Du Plessis, Smit & Sturzenegger (2007), Burger & Jimmy (2006) and Thornton (2007) provide evidence of pro-cyclical government expenditure in South Africa with government expenditure increasing in times of economic boom, and reducing in times of economic downturn, which according to Kim & Roubini (2008) may lead to a divergence between the fiscal and current account deficits.

Given the lack of research on the underlying drivers of current account dynamics in emerging markets, this study contributes to the ongoing debate on current account dynamics and fiscal policy interaction by analysing drivers of current account dynamics in emerging markets, an area which has been overlooked in literature, and the study has implications for the design of fiscal policy targeted at managing the external balances. In the next section, we move to discuss the macroeconomic developments in terms of fiscal policy innovations and current account dynamics in South Africa, and demonstrate why South Africa provides an appropriate case study for analysing the relationship between the current account and fiscal policy.

3 Current Account and Fiscal Developments in South Africa

South Africa has experienced persistent current account and fiscal deficits for over two decades, with several fiscal policy measures made in an attempt to manage the current account balance. The current account had an average deficit of 0.94% of GDP between 1985 and 2012 (SARB 2014). Deficits are characterised by increasing capital flows, low investment, reduced savings and exchange rate depreciation, with the rand depreciating by approximately 23% since the beginning of 2012, and being the most volatile amongst EME currencies (IMF 2013). These factors, together with declining commodity prices contributed to the widening of current account deficits, with a deficit of 6.3% in 2012 which was only superseded by Ukraine and Turkey amongst other EMEs (see figure 1).

Figure 1: Current Account Balance and Nominal Exchange Rate Changes: South Africa vs Selected EMEs



Sources: Bloomberg, WEO; and Fund staff estimates.

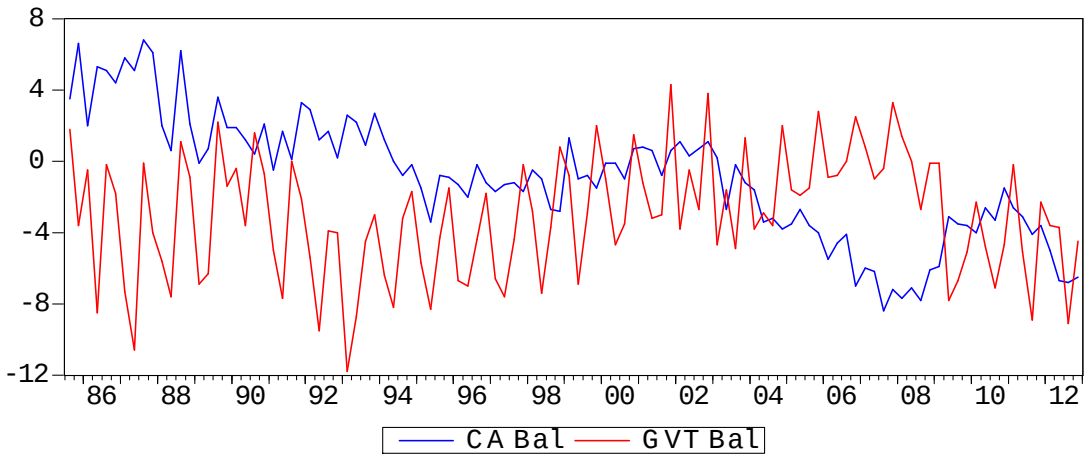
At present, South Africa's fiscal position is currently weaker than other EMEs, with high levels of government debt averaging about 42% of GDP in 2012. Government budget deficits are mostly structural in nature, with the wage bill accounting for about 30% of spending. Public sector borrowing is 4 times the level it was in 2008 and about 60% of the borrowing requirements are financed by non-residents through short term capital flows. Household savings are also low with a household debt burden averaging about 76% of disposable income in 2012 (SARB 2014). This accumulation of debt, particularly government debt, reflects the stance of fiscal policy, and the decline in gross domestic savings has contributed to the decline of the savings investment gap, and consequently a deterioration of the current account balance.

South Africa's fiscal policy has evolved through three distinct phases since the end of

apartheid. The first phase from 1994 to 2000 viewed the current account deficit as a constraint to economic growth and advocated for macroeconomic stability through reduced fiscal deficits which were also meant to reduce current account deficits. Fiscal policy between 2001 and 2006 was more targeted toward macroeconomic reform and aimed at increasing public spending to increase growth. The current account deficit was expected to widen in this period as public infrastructure investment increased in support of the growth initiative. From 2007, fiscal policy has been in support of more balanced growth through increasing both private and public investment (Jibao, Schoeman & Naraidoo 2012).

Policy perspectives on current account imbalances in South Africa have so far been based on the twin deficits approach which postulates that a fiscal expansion causes an increase in interest rates, that causes an increase in capital inflows when capital mobility is high, and appreciation of the domestic currency, thereby causing a current account deficit. The deficits exhibited in South Africa's external balance are reflective of a country living beyond its means, and in addition, the government budget balance and current account balance appear to diverge in the sample period under study 1985:Q3-2012:Q4 (see figure 2).

Figure 2: Current Account Balance and Government Budget Balance (% of GDP)



Source : *Author's compilations using data from* SARB (2014)

This contradiction of theoretical views raises the question of how fiscal policy and the external balance interact in South Africa, and motivates for a rigorous investigation into the interaction between the current account and fiscal aggregates. To investigate this interaction, there is need to determine the fiscal variables that should be included in the model together with the current account, and the priori expectations of the current account-fiscal relationship based on the Intertemporal Approach to the current account.

4 Theoretical Framework

The Intertemporal Approach to the current account by Obstfeld & Rogoff (1995) assumes that consumers in a small open economy are able to smooth consumption against country specific shocks by lending and borrowing in international capital markets. The economy produces a single composite good and has a representative household that maximises intertemporal utility subject to the budget constraint. The current account is measured by the accumulation of net foreign assets which reflects savings and investment decisions. In addition, there is only one traded asset for simplicity, a consumption indexed bond that pays a net interest of r_t. The current account in period t is defined as

$$CA_t = A_{t+1} - A_t \tag{2}$$

$$= rA_t + Y_t - C_t - G_t - I_t \tag{3}$$

where CA is the current account and A_{t+1} is the country's stock of net foreign assets at the end of period t. The intertemporal budget constraint shows that the present value of the nation's expenditure must be less than or equal to the present value of net foreign assets plus the present value of domestic production as shown in equation 4, where $R_{t,s}$ is the discount factor for consumption at date s, C, G and I are consumption, government spending and investment, and Y is output.

$$\sum_{s=t}^{\infty} R_{t,s}(C_s + G_s + I_s) \leqslant (1 + r_t)A_t + \sum_{s=t}^{\infty} R_{t,s}Y_s \qquad where \qquad \lim_{s\to\infty} R_{t,s}A_{s+1} \geqslant 0 \tag{4}$$

To derive the current account identity, the consumption path must follow the economy's intertemporal constraint such that equation 5 holds, where σ is the elasticity of intertemporal substitution.

$$C_t = \frac{(1 + r_t)A_t + \sum_{s=t}^{\infty} R_{t,s}(Y_s - G_s - I_s)}{\sum_{s=t}^{\infty} R_{t,s}(\beta^{s-t}/R_{t,s})^{\sigma}} \tag{5}$$

This characterises the current account as a function of net assets, interest rates, income, government spending and investment. The current account is thus measured by the deviation of these variables from their permanent level, where $\overset{\frown}{X}_t$ is the permanent level of variable X at date t as shown in equation 6, (see Obstfeld & Rogoff (1995) for a detailed discussion).

$$\overset{\frown}{X}_t \equiv \frac{\sum_{s=t}^{\infty} R_{t,s}X_s}{\sum_{s=t}^{\infty} R_{t,s}} \tag{6}$$

It therefore follows that the current account in period t is given by the fundamental current account equation below;

$$CA_t = (r_t - \widetilde{r_t})A_t + (Y_t - \widetilde{Y_t}) - (G_t - \widetilde{G_t}) - (I_t - \widetilde{I_t}) + \left[1 - \frac{1}{(\widetilde{\beta/R})^{\sigma}}\right](\widetilde{r_t}A_t + \widetilde{Y_t} - \widetilde{G_t} - \widetilde{I_t}) \quad (7)$$

In equation 7, domestic output above its permanent level stimulates a current account surplus due to consumption smoothing, whilst high government spending implies that the burden may be transferred to the private sector and households through an increase in taxes, hence households increase foreign borrowing to smooth consumption and this widens the current account deficit.

The government balance indicates the fiscal stance, and changes in fiscal policy affect private savings through the taxes and disposable income channel. The response of the current account to fiscal changes however depends on whether the households behave in a Keynesian or Ricardian manner. In the Ricardian view, a tax cut will lead to an increase in government debt to finance fiscal expenditure. However, residents expect the government to eventually increase taxes to pay off the public debt, hence they use the additional income from a tax cut to save in preparation for the increase in taxes. Consequently, consumption and the current account both remain unchanged because the increase in disposable income is offset by the increase in household savings. Alternatively, a fiscal expansion accompanied by a tax cut and a concurrent increase in public debt increases disposable income, and hence increases private consumption. If international capital markets are relatively closed, residents will not be able to borrow from abroad, so domestic borrowing will increase domestic interest rates, which crowds out domestic investment. This further reduces national savings and widens the current account deficit, resulting in the Keynesian view of twin deficits (Barro 1989).

Based on the fundamental current account equation and the need to analyse the interaction between the current account and fiscal policy, this study uses the current account deficit to analyse the response of the external balance to shocks. The government budget deficit is used to proxy fiscal policy, and gross domestic product is used to account for the cyclicality of output shocks. The theoretical model outlined above implies that the current account is determined by GDP and fiscal variables, but suggests no clear empirical specification. In the empirical literature it has become common to allow the most general specification to be estimated using a structural VAR approach, which takes an unrestricted VAR and uses economic theory to provide identifying restrictions. Imposing restrictions on the coefficients from theory improves the precision of estimates and reduces the forecast error variance by recovering structural innovations from the residuals. (e.g. Kim & Roubini 2000, Christiano, Eichenbaum & Evans 1999). Country specific studies on current account dynamics normally

use small scale VARs in line with the Blanchard & Quah (1989) long-run restrictions since small scale VARs are found to capture the dynamic relationships more adequately than larger scale VARs (e.g. Kano 2008, Hoffmann 2003, Chinn & Prasad 2003).

5 Identification and Data Issues

To implement the identification strategy, we follow the model by Kim & Roubini (2008), who argue that the VAR model is more useful in controlling for the endogenous component of shocks and isolating their exogenous component. A key difference from Kim & Roubini (2008) is that we reduce our model to a trivariate VAR to suit the specific objectives of this study of analysing fiscal aggregates. This helps us to specifically focus on fiscal and output shocks, and enables us to attain stable VARs. An illustration of the model specification is made using the three endogenous variables in the baseline model, namely output ($LGDP$), the government budget deficit ($GOV1$), and the current account deficit (CAD). The specification of the VAR is as in equations 8 - 2.10.

$$LGDP_t = \alpha_1 + \sum_{i=1}^{m} \beta_{1i} LGDP_{t-i} + \sum_{i=1}^{m} \gamma_{1i} GOV1_{t-i} + \sum_{i=1}^{m} \delta_{1i} CAD_{t-i} + \varepsilon_{1t} \quad (8)$$

$$GOV1_t = \alpha_2 + \sum_{i=1}^{m} \beta_{2i} LGDP_{t-i} + \sum_{i=1}^{m} \gamma_{2i} GOV1_{t-i} + \sum_{i=1}^{m} \delta_{2i} CAD_{t-i} + \varepsilon_{2t} \quad (9)$$

$$CAD_t = \alpha_3 + \sum_{i=1}^{m} \beta_{3i} LGDP_{t-i} + \sum_{i=1}^{m} \gamma_{3i} GOV1_{t-i} + \sum_{i=1}^{m} \delta_{3i} CAD_{t-i} + \varepsilon_{3t} \quad (10)$$

To identify government budget deficit shocks, it is assumed that the budget balance responds contemporaneously to changes in output, but not to changes in other variables in the model, whilst changes in the budget balance affect output only after one quarter. The restrictions $\Gamma_{1,2} = 0$[2] and $\Gamma_{1,3} = 0$ are the log run restrictions indicating that country specific shocks have no long run effect on output. $\Gamma_{2,3} = 0$ enforces the restriction that the budget balance only responds contemporaneously to changes in output and not to changes in the current account following Kano (2008), whilst the current account is affected by both output and the fiscal deficit. These restrictions are illustrated in equation (11).

[2] $\Gamma_{i,j}$ referes to the element in row i and column j of the matrix Γ.

$$\Gamma = \begin{bmatrix} \Gamma^{gdp} & \Gamma^{gdp} & \Gamma^{gdp} \\ \Gamma^{gov1} & \Gamma^{gov1} & \Gamma^{gov1} \\ \Gamma^{ca} & \Gamma^{ca} & \Gamma^{ca} \end{bmatrix} = \begin{bmatrix} \Gamma^{gdp} & 0 & 0 \\ \Gamma^{gov1} & \Gamma^{gov1} & 0 \\ \Gamma^{ca} & \Gamma^{ca} & \Gamma^{ca} \end{bmatrix} \tag{11}$$

Variable ordering is also used as an identification scheme where contemporaneously exogenous variables are ordered first. In the baseline model with the government budget balance, real GDP is ordered first as it is not likely to contemporaneously respond to other variables in the system. The government balance is ordered after real GDP because components of government revenue may be affected by the current level of economic activity. Other studies such as Blanchard & Perotti (2002), Kim & Roubini (2008) and Rafiq (2010) concur with this view of ordering the government balance after real GDP. Kim & Roubini (2008) argue that conditioning on current real GDP gives room to control for the current endogenous reaction of the government primary deficit to current activity. In addition, not conditioning on other variables gives room for identifying the exogenous changes in the government deficit, since such changes are less likely to depend on other variables due to the decision lag of fiscal policy. The current account is ordered third after real GDP and the government budget balance because of the assumption that real output growth is pre-determined with respect to the current account.

Whilst the government budget deficit is used to proxy fiscal shocks, government spending shocks are also used as robustness checks. When government spending shocks are used in place of the fiscal deficit, the identification strategy assumes that government spending does not contemporaneously respond to changes in other variables, whilst other variables are contemporaneously affected by government spending shocks. This identification scheme follows Blanchard & Perotti (2002) and Kim & Roubini (2008), and it implies that government spending is assumed to be exogenous to other non government variables in the system, hence it is ordered first.

In dealing with VAR models, the VAR system may be overparameterised and under identified. This raises the need for Blanchard & Quah (1989) restrictions to recover permanent and transitory components of shocks by specifying a particular long run relationship between the variables and constraining the matrix of long run multipliers. This technique however requires at least one of the variables to be I(1) since I(0) variables do not have a permanent component. Restricting the shocks on the long run relationship gives the exogenous shocks ε_{1t}, ε_{2t} and ε_{t3} such that each variable is a function of own shocks and shocks to other variables.

Making the assumption that GDP is not contemporaneously affected by other variables in

the system, at least one of the shocks has a temporary effect on an endogenous variable implies the model is restricted as in equation 12;

$$\begin{bmatrix}\begin{bmatrix}\Delta LGDP_t\\ \Delta GOV1_t\\ \Delta CAD_t\end{bmatrix}\end{bmatrix} = \begin{bmatrix}\begin{bmatrix}C_{11}(L) & 0 & 0\\ C_{21}(L) & C_{22}(L) & 0\\ C_{31}(L) & C_{32}(L) & C_{33}(L)\end{bmatrix}\end{bmatrix} \begin{bmatrix}\begin{bmatrix}\varepsilon_{\lg dp,t}\\ \varepsilon_{gov1,t}\\ \varepsilon_{cad,t}\end{bmatrix}\end{bmatrix} \tag{12}$$

where the standard form of the VAR is

$$ß(L)X_t = e_{it} \tag{13}$$

$$\Longrightarrow X_t = ß(L)^{-1}e_{it} \tag{14}$$

$$\Longrightarrow X_t = C(L)e_{it} \tag{15}$$

X_t is a vector of variables used in the VAR model, $ß(L)$ is the coefficient matrix, $C(L) = ß(L)^{-1}$, and e_{it} is a vector of innovations that are mutually uncorrelated. To recover the structural parameters in the system, we use equation 16, where $u_{\lg dp,t}$, $u_{gov1,t}$, and $u_{cad,t}$ are the structural disturbances. This lower triangular just identified system forms the basis of the identifying restrictions used in this paper, with successive models specified and identified in a similar manner, and compared to alternative overidentifying restrictions.

$$\begin{bmatrix}\begin{bmatrix}\varepsilon_{\lg dp,t}\\ \varepsilon_{gov1,t}\\ \varepsilon_{cad,t}\end{bmatrix}\end{bmatrix} = \begin{bmatrix}\begin{bmatrix}1 & 0 & 0\\ C_{21}(L) & 1 & 0\\ C_{31}(L) & C_{32}(L) & 1\end{bmatrix}\end{bmatrix} \begin{bmatrix}\begin{bmatrix}u_{\lg dp,t}\\ u_{gov1,t}\\ u_{cad,t}\end{bmatrix}\end{bmatrix} \tag{16}$$

In applying this model to South Africa, quarterly data from the third quarter of 1985 to the last quarter of 2012 are used. The starting point of 1985:03 corresponds with the start of the dual exchange rate regime in South Africa, so the sample covers two exchange rate regimes, the dual and the free float. A dummy variable is included to cater for the switch to a free floating exchange rate/financial liberalisation at the end of the first quarter of 1995, with 1 indicating the floating exchange rate from 1995:Q2 to 2012:Q4, and zero otherwise. Seasonal dummy variables are also included, together with a dummy variable that controls for the effects of the financial crisis on output. All data are obtained from the South African Reserve Bank (SARB 2014).

The current account deficit (CAD) is measured as the ratio of the current account balance to GDP in percentage terms. Values greater than zero indicate a deficit and those less than zero, a surplus. This conversion is for ease of interpretation since South Africa's current account balance has an average deficit for the period under study, so results are interpreted

in terms of a "current account deficit". The government budget balance (GOV1) is used to analyse the effect of fiscal policy on the current account through budget deficit shocks. The variable measures the government deficit or surplus as a percentage of GDP. As in the case of the current account balance, the variable is converted such that values greater than zero are a deficit whilst those less than zero are a surplus. This conversion is also for ease of interpretation with results interpreted in terms of a government budget deficit. Real gross domestic product (LGDP) is measured by gross domestic product at 2010 constant prices. This variable is included to analyse the impact of output shocks and is measured in logs. Output controls for variations in business cycles and endogeneity of the fiscal and external balance. Government expenditure as a ratio of GDP (GOV2), and government consumption as a ratio of GDP (GOV3) are used to generate government spending shocks[3]. Alternative fiscal measures used to test robustness in literature range from public consumption (e.g. Bartolini & Lahiri 2006, Marinheiro 2008), government surplus (e.g. Calderon et al. 2002) and government spending (Kim & Roubini 2008). However, because South Africa's fiscal position has mostly been in deficit, this study uses government spending variables to reflect a deficit generated through excess expenditure. Current account components used to analyse the transmission of fiscal shocks are the trade balance as a percentage of GDP (TBAL), which is used to analyse how fiscal shocks are transmitted to trade activities, the ratio of household savings to disposable income (HSAV), net savings by the general government as a percentage of GDP (GSAV) and gross investment by the general government (GINV) are used to analyse the transmission of fiscal shocks via the savings and investment behaviour of the government and private agents. Lastly the ratio of final household consumption to GDP (HCONS) is used in order to infer household behaviour in response to fiscal shocks and how this response transmits to the current account.

6 Results

Given that the main objective of this paper is to analyse the relationship between the current account balance and the fiscal balance, the model examines the effect of fiscal deficit shocks on the current account, with fiscal deficit shocks generated through the government budget balance. The descriptive statistics (table 1) show a maximum current account deficit of 6.8% of GDP and a maximum fiscal deficit of 11.8% of GDP for the period under review with maximum government expenditure and government consumption of 33.7% and 20.7% of GDP respectively.

The correlation coefficients in table 2 show the government budget deficit and current account

[3]Government consumption includes expenditure on goods and services only whilst government expenditure includes all expenditure on goods, services, investment and transfers.

Table 1: Descriptive Statistics

	MEAN	STD. DEV	MIN	MAX
CA Def	0.9373	3.4403	-6.8	8.4
Gov Def	-3.0627	3.4095	-11.8	4.3
Gov Exp	25.9400	2.5842	19.9	33.7
Gov Cons	18.8327	0.8591	16.1	20.7
LGDP	14.0958	0.2189	13.091	14.4931

Table 2: Correlation Coefficients

	CA Def	LGDP	Gov Def		CA Def	LGDP	Gov Def
CA Def	1.0000			Hhld Sav	-0.7665	-0.7713	0.2992
LGDP	0.8363*	1.0000		Gvt Sav	-0.0388	-0.1544	-0.6653
Gov Def	-0.1551	-0.1793		Gvt Inv	-0.0845	0.0381	-0.1208
Gvt Exp	0.1347	0.1097		Hhld Cons	0.4247	0.1488	-0.0748
Gvt Cons	0.2876	0.4587					
TBal	-0.9771*	-0.8135*	0.0999				

Note: Results reported are limited only to the variables that interact in the models.

deficit are negatively correlated, implying that budget deficit shocks may lead to a current account improvement, which is indicative of a divergence of the two deficits. Output shocks may worsen the current account deficit based on the positive correlation between the two variables. This indicates the possibility of a current account deficit generated by business cycle fluctuations. The correlation coefficient between output and the current account is high (0.8363), however, because comovements between the current account and fiscal balance could potentially be explained by output shocks (see Kim & Roubini 2008), so real GDP is kept in the model. The same argument explains the high correlation between the trade balance and output.

Results from stationarity tests, using the Augmented Dickey-Fuller (ADF) method, showed that all variables except government consumption and household consumption have unit roots[4]. The Phillips Perron method confirms these results. Having found the variables to be stationary in first difference form, various model specifications were used to analyse the impact of fiscal shocks on the current account and the channels through which a government budget deficit shock is transmitted to the current account. This is done through the use of impulse response functions and variance decompositions, where the impulse response functions show the effects of a shock to one endogenous variable on the other variables in the system[5].

Figure 3 shows the response of the variables to shocks, with row 1 column 1 showing the

[4]Given that almost all of the variables are integrated of order 1, the Johansen Cointegration test is conducted and the results show that the variables are not cointegrated.

[5]Model specifications are in table 9 in the appendix.

Table 3: Stationarity Tests using ADF Method and Phillips-Perron Method

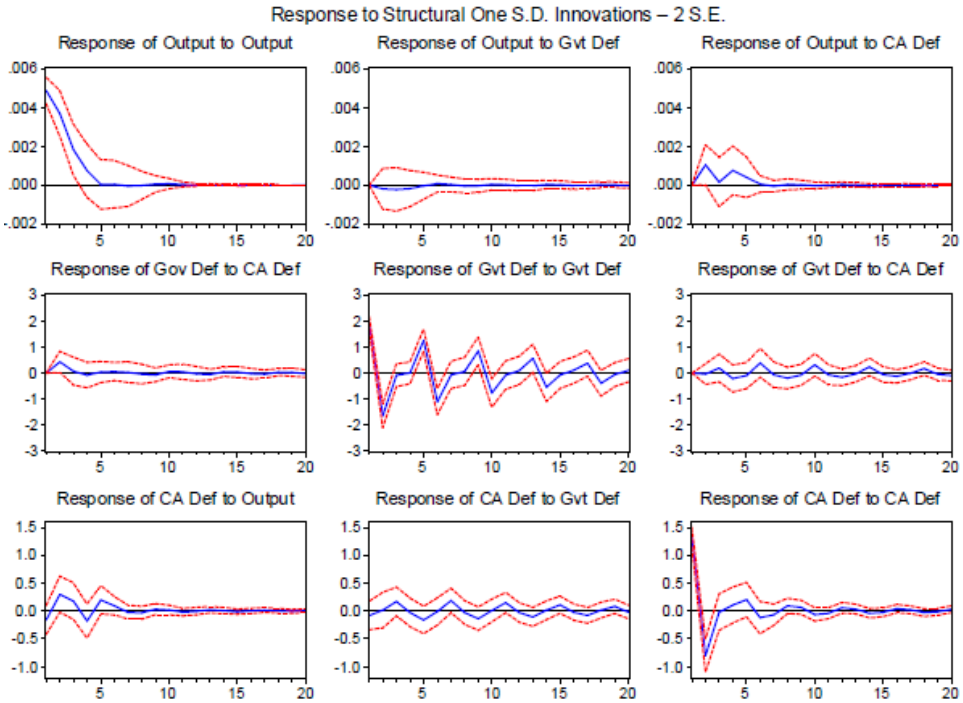
ADF

	Levels		1st Difference	
	Intercept	Intercept + Trend	Intercept	Intercept + Trend
LGDP	0.9962	0.5698	0.0001	0.0002
CA Def	0.7400	0.0942	0.0000	0.0000
Gov Def	0.2749	0.7458	0.0000	0.0001
Gvt Exp	0.8753	0.9857	0.0000	0.0000
Gvt Cons	0.0052	0.0024		

Note: H_0 - Series has a unit root.
Table records P-values of each test

response of output to a percentage change in itself (own shock), column 2 shows the effect of a government deficit shock and column 3, the effect of current account deficit shock. Row 2 shows the responses for the government budget deficit and row 3 shows current account deficit responses.

Figure 3: Impulse Response Functions - Government Budget Deficit



Clearly, a government budget deficit shock has very little impact on output, with only as much as a 0.001 percentage point (pp)[6] increase which dies out within a year. The effect of a positive shock to the current account deficit (worsening of the current account deficit) on output is also small. A fiscal deficit shock also has a very small and insignificant impact

[6]For illustrative purposes, a 0.1 percentage point increase entails an increase form 6% to 6.1%.

on output, that is, output reduces by 0.001pp in period 2. Row 2, column 1 shows that a positive output shock worsens the fiscal deficit by 0.4pp in the second quarter, but this deterioration is short lived and is eroded by the third quarter, dying out after 12 quarters. The deterioration of the fiscal balance when there is a boon is indicative of procyclical fiscal policy. There is a slightly smaller, but more persistent effect of the current account deficit shock on fiscal deficits, with the government budget deficit increasing by 0.3pp in the first quarter and eventually declines, though the decline is still evident at the end of the period.

A larger and more persistent effect is evident from the budget deficit own shock, which induces an improvement of the current account by 0.07pp within the first quarter and 0.23pp in quarter 5, and while dying out, this shock persists until the end of the period (row 3 column 2). This is an interesting results as it implies that an increase in the budget deficit (a worsening of the fiscal deficit) leads to an initial decline in the current account deficit (an improvement of the external balance), which is not consistent with the twin deficits hypothesis that informs South African policy, as this requires fiscal and current account deficits to be positively correlated.

It is also interesting to note that the impact of a current account deficit shock on the fiscal deficit was initially positive, suggesting that whilst fiscal expansion improves the current account position, a positive shock to the current account deficit worsens the fiscal deficit instead before it improves. This provides further evidence against the twin deficits hypothesis as the direction of effect between fiscal deficits and current account deficits should be two way for the twin deficits hypothesis to hold, i.e. an increase in the fiscal deficit should worsen the current account deficit and simultaneously, an increase in the current account deficit should worsen the fiscal deficit. Lau et al. (2010) find similar results for Malaysia, Thailand and the Philippines, where fiscal expansion improves the current account position. This could be explained by government's need to expand the fiscal deficit through increased borrowing to finance the current account deficit when it widens. They also find evidence of causality running from the current account deficit to the fiscal deficit only in Indonesia and Korea, with only Philippines showing bidirectional causality. This is supporting evidence of the need for case studies for such an analysis as the twin deficits hypothesis appears to fail in some emerging markets.

The impulse response function results in the above discussion provide the total effect of the shocks (random innovations), but it is useful to know the contribution made by each of the variables in the VAR and this is provided by the variance decomposition results in Table 4. The first block in this table shows the decomposition of the total response of output to shocks, with columns 1, 2 and 3 showing the contribution of output, the fiscal deficit and the current account deficit to the variation of GDP to shocks. Block 2 decomposes the total

response of the fiscal deficit, and block 3 the total response of the current account deficit to shocks.

Table 4: Structural Variance Decomposition
Period

VD of Output	Output	Gvt Def	CA Def
1	97.9702	0.0906	2.0022
4	98.0577	0.0979	1.8444
12	98.0878	0.1105	1.8017
30	98.0840	0.0039	1.8021
VD of Gvt Def	Output	Gvt Def	CA Def
1	0.0541	97.2916	2.6543
4	2.9630	92.2443	4.7928
12	2.4706	90.7934	6.7360
30	2.4179	90.3579	7.2243
VD of CA Def	Output	Gvt Def	CA Def
1	0.0316	3.0235	96.9489
4	2.5626	4.9370	92.5004
12	2.5302	8.6723	88.7974
30	2.5277	9.8898	87.5829

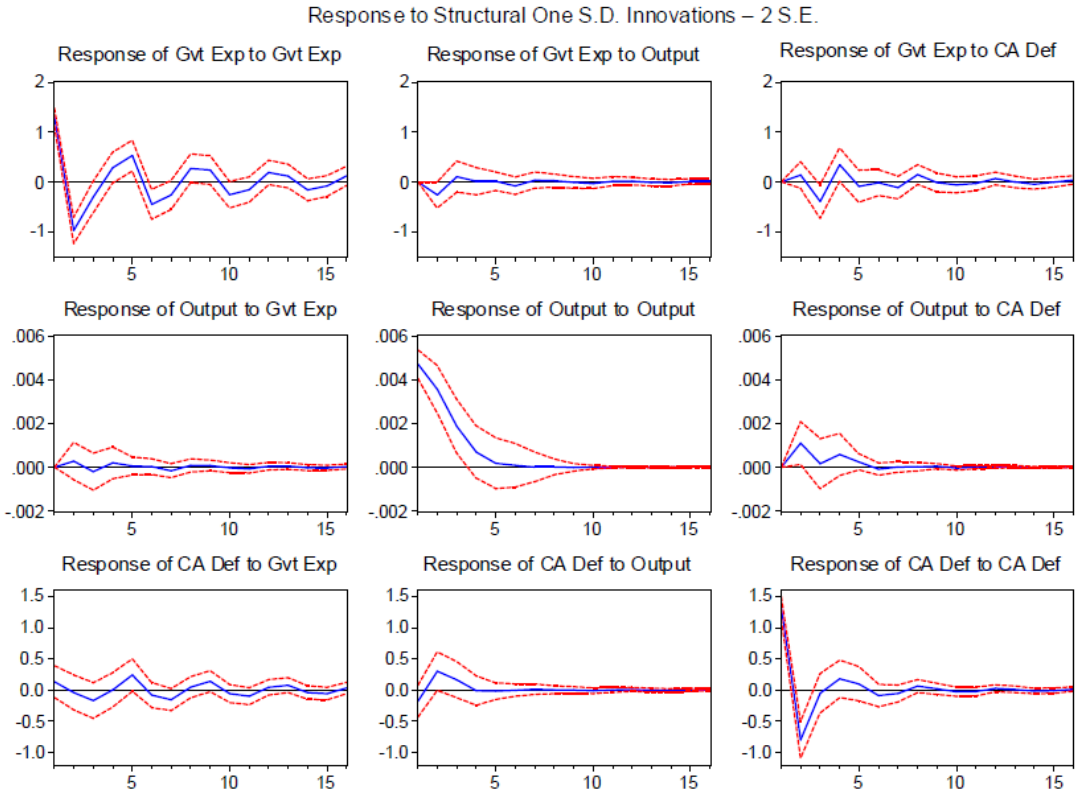
From the variance decompositions, column 2 of the first block shows that the government budget deficit shocks have a very small effect on output, with a contribution of less than 1%, even at longer horizons and the contribution of the current account deficit shock to variations in output is also small (only 2% of the variation is output accounted for by the current account in the first quarter and less using a longer horizon). Of Interest though is the finding that growth (output) seems to be more affected by the current account deficit as opposed to the fiscal shocks, showing the importance of managing the current account balance for macroeconomic stability.

Whilst the current account accounts for 2.65% of the variation in the fiscal balance (second block, column 3) in the first quarter, the importance of the current account in explaining fiscal shocks increases to 7.2% at longer horizons. This demonstrates the importance of fiscal shocks in determining the external balance because of their persistence (see figure 3, row 2 column 3). Output shocks only account for at most 2.96% of the variation in the fiscal balance after 4 quarters (second block column 1), showing that the fiscal balance is more affected by shocks to the current account than by output shocks in this case.

Decomposition of the current account (block 3) shows that whilst the current account is largely affected by own shocks which have a contribution of 96.94% in the first quarter, this contribution falls at longer horizons to 87% as the impact of government budget deficit shocks on the current account comes into play (block 3 column 3). The contribution of the fiscal

deficit increases from 3.02% in the first quarter to almost 10% after 12 quarters, indicating that fiscal policy has a stronger impact on current account dynamics at longer horizons. This is in line with the results found in figure 3 (row 3, column 2) which confirm that the current account is largely affected by expansionary fiscal shocks which improve the external deficit. The importance of fiscal shocks in current account dynamics suggests that efforts to reduce the fiscal deficit through fiscal consolidation may in fact result in a worsening of the current account deficit if not approached with caution. This result departs from the twin deficits hypothesis and is in support of other studies that find similar results and attribute the divergence of the two deficits to the endogeneity of the fiscal and external balances (e.g. Kim & Roubini 2008, Rafiq 2010). The endogeneity of the fiscal and external deficits is shown by the contribution of output shocks to the variation in these deficits, which is at most 2.9% and 2.6% for the fiscal and current account deficit respectively. These figures are however small, showing little evidence of endogeneity, so the result will be revisited in the following section using government spending shocks to analyse if there in fact is any evidence of endogeneity.

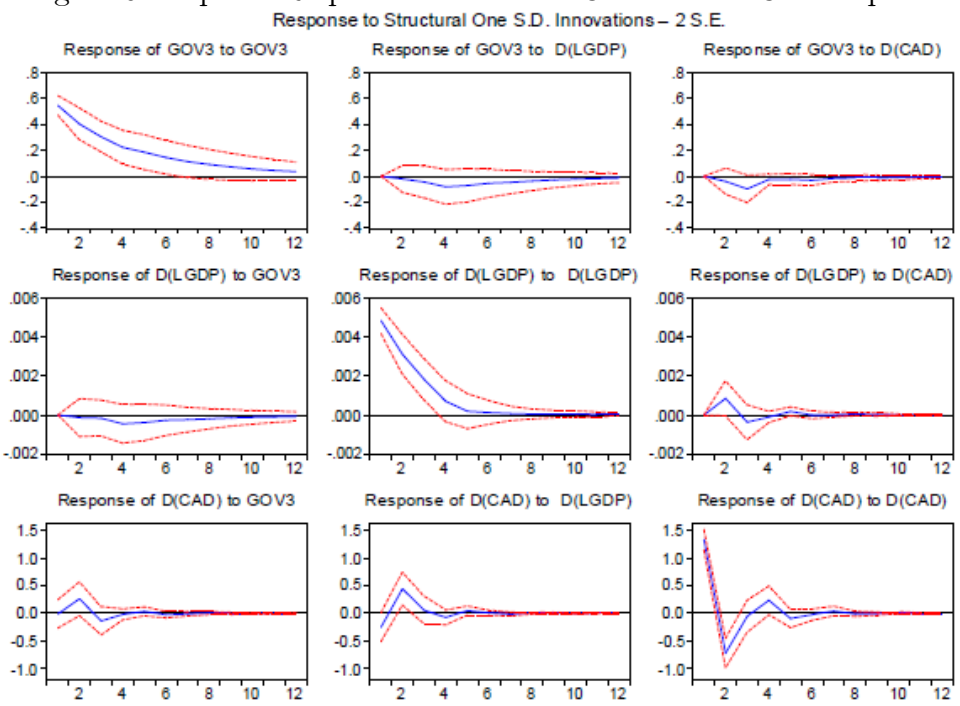
Figure 4: Impulse Response Functions - Government Expenditure



In the part that follows, government spending shocks are used as alternative specifications of the fiscal variable to test whether the negative relationship between fiscal expansion and the current account deficit continues to hold. The study generates government spending shocks through government expenditure (GOV2) and government consumption (GOV3). Spending

shocks are preferred since a worsening of the fiscal deficit can either be achieved by increasing government spending, or reducing the tax base. The impulse response functions are in figures 4 and 5, where the fiscal shock is denoted by shock 1, whilst shocks 2 and 3 are GDP and current account shocks respectively. Row 1 shows the response of the government spending variable (government expenditure in figure 4 and government consumption in figure 5), row 2 shows the response of GDP, row 3 the response of the current account deficit. Columns 1, 2 and 3 show shocks to government spending, output and the current account deficit respectively.

Figure 5: Impulse Response Functions - Government Consumption



In response to an expansionary government expenditure shock (see figure 4), the current account improves with a peak improvement of 0.23pp in period 3 (see row 3 column 1). This improvement outweighs the small initial decline in period 2 and is very similar to the results found with a fiscal deficit shock both in the direction of the response and in magnitude. Like in the case of the government budget deficit and government expenditure, a shock to government consumption also generates an improvement in the current account balance. The current account improves by about 0.13pp in the first three quarters (see figure 5, row 3 column 1). The impact of government consumption shocks on the current account is smaller than government expenditure and government budget deficit shocks, and is also short lived, dying out after about 10 quarters[7]. This shows that regardless of how the fiscal variable is specified, an expansionary fiscal shock leads to an improvement of the current account

[7]The data shows a very high correlation between the log of real government consumption and GDP (0.96), hence to avoid multicollinearity, the ratio of government consumption to GDP is used.

position, implying that the twin deficits hypothesis which informs policy formulation in South Africa does not hold.

Tables 5 and 6 show the variance decomposition of the variables when a government expenditure shock and government consumption shock are respectively used in the model. In both instances, output is largely explained by shocks to government spending which have a contribution of about 20% for government expenditure and 25% for government consumption, implying fiscal expenditure shocks account for a quarter of the variation in output, whilst output shocks account for as much as 27% of the variation in fiscal expenditure (table 5, block 1 column 2). This shows that the divergence between the current account and fiscal deficits displayed in figure 4 can be explained by the endogeneity of the fiscal balance which is evidenced by output shocks explaining a significant portion of the variation in government expenditure. The current account in this case is slightly more affected by budget deficit shocks (9.89% in period 30 in figure 3) than it is by government spending shocks (5.66% in period 30 in figure 4). Despite this, the effect of fiscal shocks on the current account still matters and increases at longer horizons, suggesting that output shocks generate diverging movements between the current account balance and the government balance.

Table 5: Structural Variance Decomposition - Government Expenditure

Period			
VD of Gvt Exp	Gvt Exp	Output	CA Def
1	78.3213	21.5778	0.1009
4	61.9141	27.7545	10.3315
12	62.5471	27.7493	9.7036
30	62.5559	27.7623	9.6819
VD of Output	Gvt Exp	Output	CA Def
1	20.6377	76.0861	3.2762
4	20.3922	77.1754	2.4324
12	20.4337	77.0950	2.4713
30	20.4403	77.0863	2.4734
VD of CA Def	Gvt Exp	Output	CA Def
1	0.0070	0.2018	99.7912
2	0.2007	1.2636	98.5357
12	5.2138	2.4815	92.3047
30	5.6595	2.6833	91.6572

Two particularly interesting results arise from this analysis which are summarised in table 7. The first column summarises the impact of fiscal shocks on the current account, the second column summarises the variation in the current account deficit explained by fiscal shocks in the variance decomposition, and the third column explains the percentage of variation in the current account explained by output shocks. First, expansionary fiscal shocks reduce

Table 6: Structural Variance Decomposition - Government Consumption

Period			
VD of Gvt Cons	Gvt Cons	Output	CA Def
1	80.5450	18.9219	0.5331
4	75.1101	22.3924	2.4975
10	74.8452	22.3088	2.846
VD of D(LGDP)	Gvt Cons	Output	CA Def
1	24.4785	75.3098	0.2117
4	24.6778	73.5642	1.7580
10	24.6593	73.5718	1.7689
VD of CA Def	Gvt Cons	Output	CA Def
1	0.8888	4.5197	94.5915
4	1.2845	12.4054	86.3102
10	1.3743	12.7048	85.9209

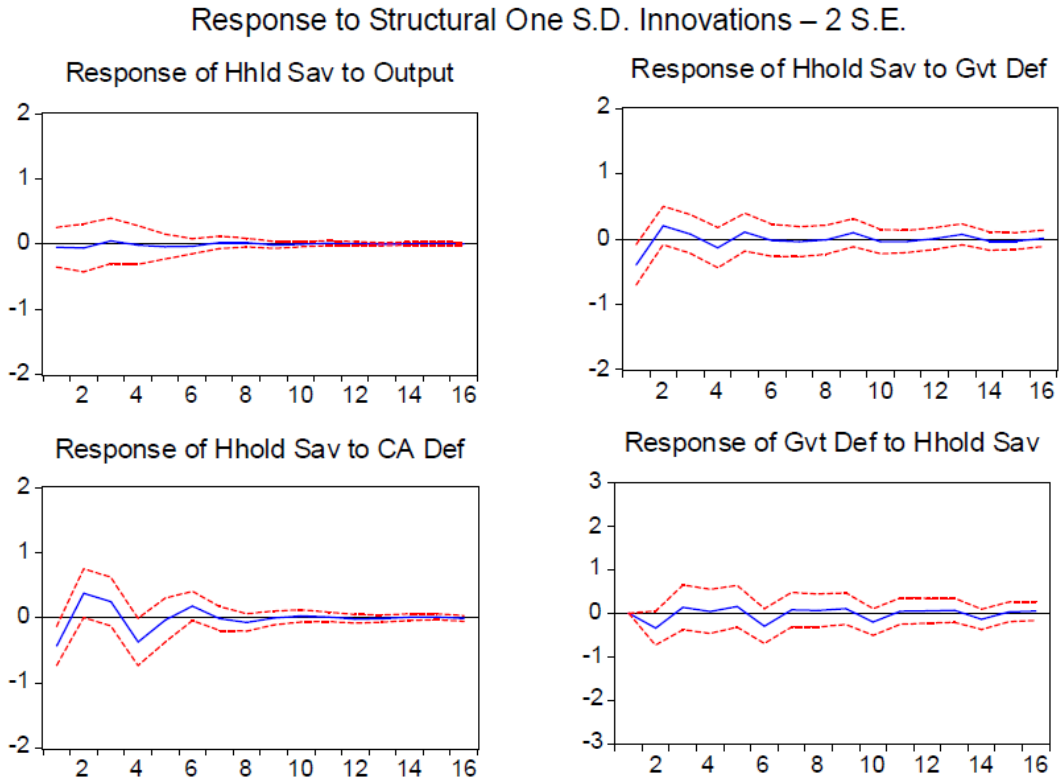
Table 7: Summary of Current Account Deficit Response to Expansionary Fiscal Shocks

	IRF of CA Def	VD of CA Def	Endogeneity
Gov Def	0.24pp improves	9.8%	2.96%
Gov Exp	0.23pp improves	5.65%	27.76%
Gov Cons	0.13pp improves	1.37%	22.39%

current account deficits with all 3 specifications of the fiscal variable, and fiscal variables account for as much at 10% of the variation in the current account. This could be explained by the endogeneity of fiscal expenditure which is shown by the proportion of output shocks that explain the fiscal variable. Similar findings on endogeneity are found in Kim & Roubini (2008), and comparison of these results shows that endogeneity of fiscal expenditure is much stronger in developed countries than in emerging markets, which conforms to expectations since developed countries have stronger business cycle effects. More endogeneity is found in the fiscal spending variables as the fiscal balance also contains revenue aspects. The second interesting result is the variation in the magnitude of the current account response between government expenditure and government consumption which shows that government expenditure shocks improve the current account more than government consumption shocks. This suggests that components of government expenditure such as investment which are not included in the government consumption variable may be responsible for the transmission of fiscal shocks to the current account. As such, there is need to empirically determine the channels through which fiscal shocks are transmitted to the current account to determine the best response fiscal policy could take to manage the external balance.

To analyse the channels through which fiscal shocks are transmitted to the current account, the components of the current account that we use include private and public savings and investments components, and the trade balance. Household consumption is used is used to infer household behaviour in response to fiscal policy, and how such behaviour filters to

Figure 6: Transmission of Fiscal Shocks to Household Savings

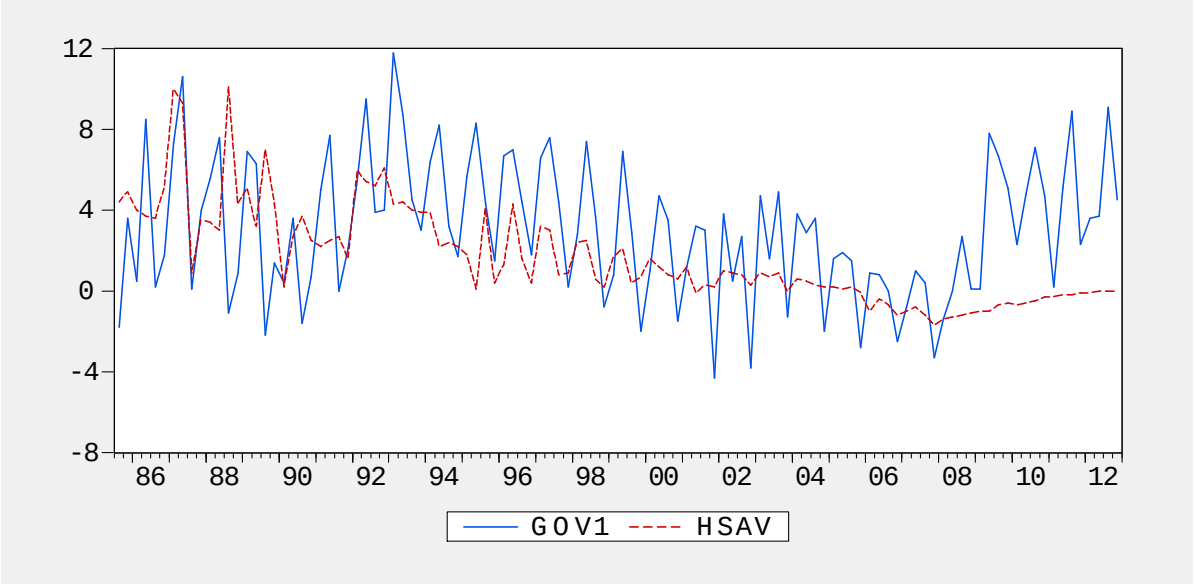


the current account. Since the focus of the study is on the divergence between the fiscal and current account deficits, the study reverts to using the original model with government budget deficit shocks for this analysis, with a current account component added to this model. Impulse responses showing the transmission of fiscal shocks to household savings are shown in figure 6, and the rest are shown in the appendix.

In response to a government budget deficit shock, the trade balance improves by 0.08pp in the first period, with a maximum impact of 0.27pp in period 3 (see figure 9). The shock is persistent and dies out after 7 years and the result is very similar to the effect on the overall current account. Both household savings and government investment are significantly impacted by government budget deficit shocks. A shock to the government budget deficit increases the proportion of household savings to disposable income by 0.71pp in period 1 whilst household consumption falls by 0.03pp. This suggests that households behave in a partial Ricardian manner by saving in anticipation of a future tax increase when there is an expansionary fiscal deficit shock, and offset this increase in savings by a slight reduction in consumption. The Ricardian behaviour displayed by households is also shown in the data where household savings are highest when the government runs large deficits, and household savings fall when the fiscal deficit is reduced (see figure 7).

Whilst household savings increase, net savings by the government fall by 0.77pp in period

Figure 7: Household Partial Ricardian Behaviour



1, with a persistent decline suggesting that government savings take time to recover form a budget deficit shock. A shock to the government budget deficit reduces private investment by 0.07pp in period 1, with a long run effect that dies out after about 50 quarters, hence crowding out private investment. Government investment on the other hand increases by about 0.05pp in the first period, with the impact of the shock lasting for almost 40 periods. The substantial increase in household savings following an expansionary fiscal shock thus has the overall effect of improving the savings investment gap and reducing household consumption by as much as 0.06pp. In addition, the fall in gross investment shows that private investment is significantly crowded out by a fiscal shock, suggesting that government investment should be productive, for example, investment in infrastructure to attain maximum benefits. Lastly, the results stress the need for the correct policy formulation in terms of the fiscal approach to managing current account deficits as the effects of the fiscal policy on current account components are quite persistent, and deviate from the theoretical expectations of the twin deficits hypothesis. lastly, we also analyse the impact of fiscal shocks on the trade balance and find that an expansionary fiscal shock improves the trade balance by about 0.2pp, a result which is consistent with the impact of fiscal shocks on the current account.

Finally, to make viable inferences from these results, it is important for the VAR models to be stable since instability renders the standard errors and impulse response functions invalid. For all estimated models, the results mostly show that the roots lie inside the unit circle verifying stability, there is no evidence of serial correlation, and errors are homoscedastic and normally distributed. Results for these diagnostic tests are reported in the appendix, and show that the model is econometrically sound and the results can be relied on for policy inference. We also test robustness of these results to alternative identification schemes

described in equation 8, and find that the diverging movement between the current account deficit and fiscal deficit still holds. This leads us to conclude that the results are robust to identification and specification, and are not significantly affected by the choice of identifying restrictions used.

Table 8: Alternative Identification Restrictions

$$\begin{Bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ g_{31} & g_{32} & 1 \end{Bmatrix}$$

$$\begin{Bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ g_{31} & g_{32} & 1 & 0 \\ g_{41} & g_{42} & g_{43} & 1 \end{Bmatrix}$$

Note: Overidentifying restrictions are not rejected in each case.
The first set of restrictions is used in the baseline model.
The second set of restrictions is used with current account components.

7 Conclusion

The debate on global current account imbalances continues to develop, with growing interest in the macroeconomic instability and widening current account deficits faced by emerging markets. The approach generally taken to reduce current account deficits in South Africa entails the reduction of fiscal deficits in line with the Mundell-Fleming twin deficits hypothesis. However, it is well established in literature that the current account behaves differently to macroeconomic circumstances in countries of different income levels, so approaches to managing external imbalances and fiscal deficits should be tailored to a country's macroeconomic conditions. Despite this, there is still a lack of investigation into drivers of current account dynamics in emerging markets. The lack of focus in this area of study raises the need to analyse current account determinants, together with the impact of macroeconomic policy on current account dynamics in emerging markets so as to determine how external imbalances can best be managed.

We use a Structural Vector Autoregressive model (SVAR) to analyse the effect of fiscal shocks on the current account and the usefulness of fiscal consolidation in managing current account deficits. Our main objective is to understand how fiscal shocks shape current account developments and establish whether the twin deficits approach to managing the external balance holds in middle income countries. We further analyse the channels through which fiscal shocks are transmitted to the current account so as to understand how current account

management policies should be formulated. South Africa is used as a case study because it is an emerging market characterised by large current account deficits and macroeconomic volatility due to business cycle fluctuations. In addition, South Africa provides a rich time series data set which has not been exploited to understand the external balance.

The main findings show that because of the endogeneity of the government budget balance, expansionary fiscal spending shocks are persistent and improve the current account, whilst current account. This is a novel result which provides stylised facts on the interaction of fiscal policy and the current account in South Africa. In addition, the transmission of fiscal shocks to the current account is primarily through an increase in household savings and decline in household consumption in response to an expansionary fiscal shock, with government investment crowding out private investment. These results contradict the twin deficits hypothesis which has tended to inform policy and provide new insights on the relationship between the external balance and fiscal policy in South Africa. Similar findings have been found in developed countries (e.g. Kim & Roubini 2008, Rafiq 2010), though the magnitude of the results is smaller in emerging markets, given that they have slightly weaker business cycles than developed countries. The results suggest that in the presence of an endogenous government balance, output shocks have a pronounced effect on the fiscal and external balance, and as a result, fiscal consolidation is not effective in reducing current account deficits since a boom increases export capacity whist stimulating government spending as well. Under such circumstances, there is need for productive government expenditure, for example investment in infrastructure to improve the external balance once the returns from investment have been recouped, and productive capacity increased. There is also a need for incentives to boost household savings so as to improve the saving-investment position as household saving is more responsive to fiscal shocks than government saving. Such coordinated policies would be helpful in generating a more manageable external position which is in line with macroeconomic fundamentals.

These findings provide a novel perspective of how fiscal policy affects the current account in South Africa, and in light of these results. further research should investigate the optimal fiscal policy that generates a sustainable current account position.

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A Appendix

Figure 8: Transmission of Fiscal Shocks to Household Consumption

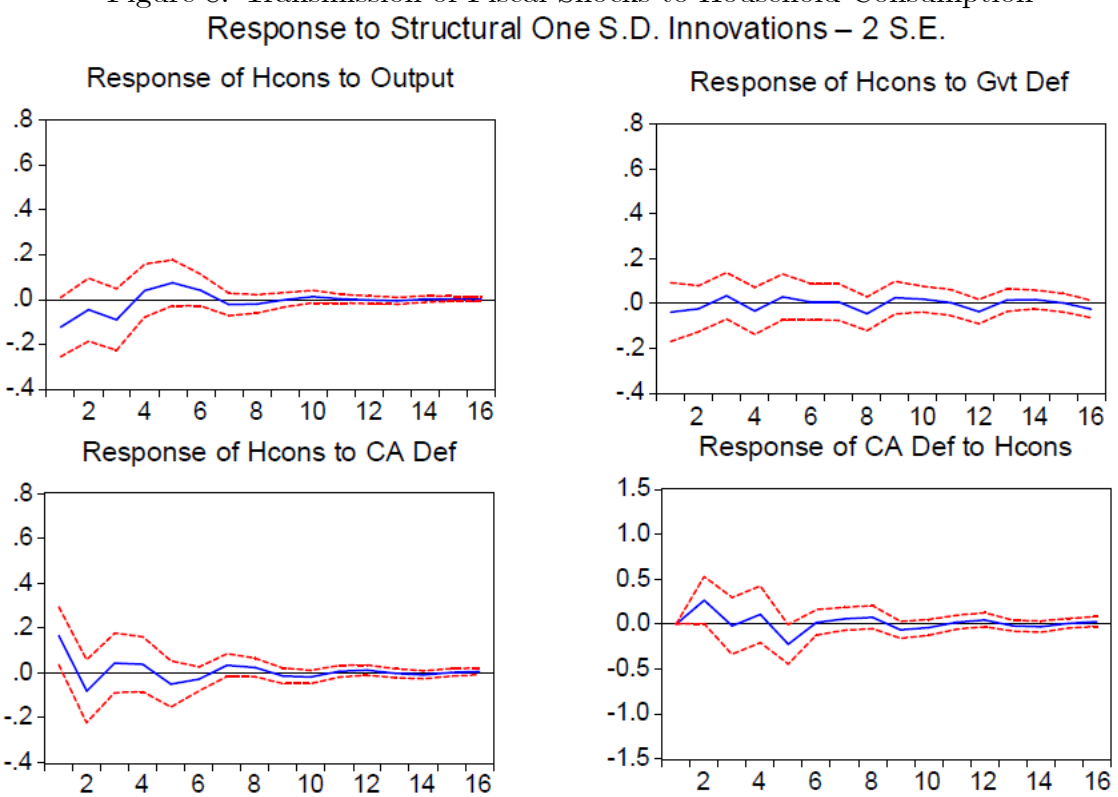

Table 9: Diagnostic Tests

Model	Specification	LM	JB	White
1	Output, Gov Def, CA Def	0.3800	0.3092	0.0740
2	Gov Exp, Output, CA Def	0.5792	0.1677	0.1827
3	Gov Cons, Output, CA Def	0.0662	0.5407	0.0134

Figure 9: Transmission of Fiscal Shocks to the Trade Balance

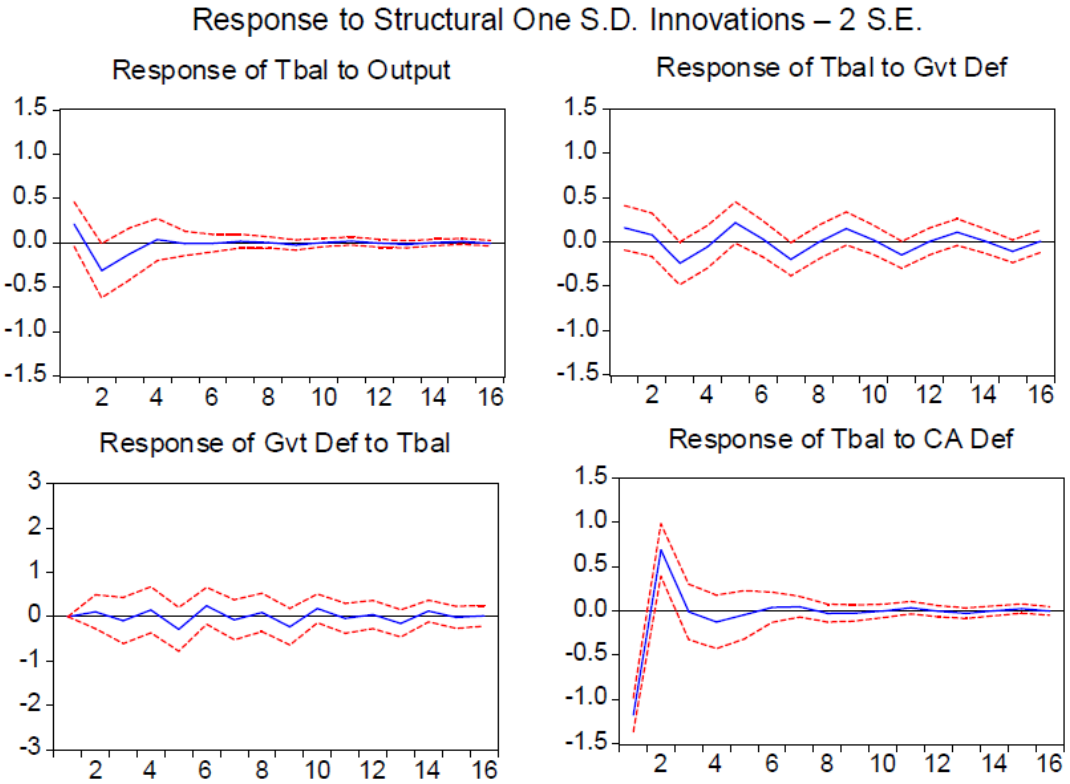

Figure 10: Stability of the VAR